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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/595,974

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Koichiro Aoyagi

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1077

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EXAMINER

FINK, BRIEANN R

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

06/04/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/595,974	<b>Applicant(s)</b> AOYAGI ET AL.	
	<b>Examiner</b> Briann R. Fink	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/14/09 and 5/4/09</u> .                                      | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This office action follows a reply filed on February 20, 2009. Claims 1, 7, and 20 have been amended. Claims 16-19 have been canceled. Claims 1-15 and 20 are currently pending and under examination.
2. Applicant's arguments, see pages 9 -11, filed February 20, 2009, with respect to the rejection(s) of claim(s) 1-15, and 20 have been fully considered and are persuasive.
3. The rejection of claims 1, 4-15, and 20 under 35 U.S.C. 102(b) over *Wang* (US 6,639,032) has been withdrawn; however, upon further consideration, a new ground of rejection is made over *Wang*.
4. The rejection of claims 1-3 over 35 U.S.C. 102(b) over *Ohsawa* (US 6,551,758) has been withdrawn; however, upon further consideration, a new ground of rejection is made over *Wang*.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 1-15 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 claims a multi-branched polymer with a specific repeating unit. As *a* is at least 2, it is unclear as to whether the functional group Y is repetitive from

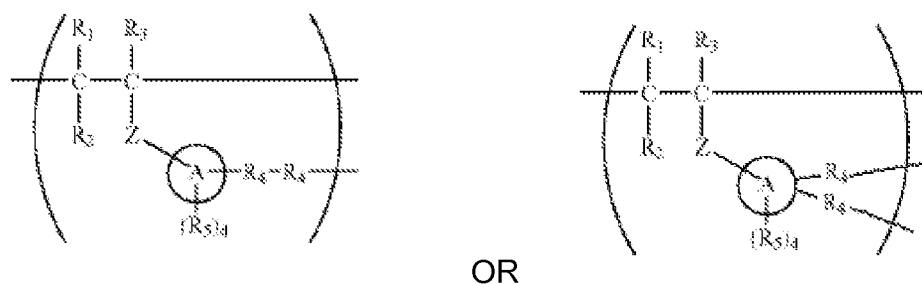
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itself, or always from X. For example, when  $a$  is 2, one of ordinary skill in the art may read the invention to be either of the following:



Therefore, claim 1 is indefinite because it is unclear as to which multi-branched polymer the applicant is claiming as the invention. Claims 4, 7, and 10 are similarly rejected.

Claim 2 claims a multi-branched polymer with a specific repeating unit. As  $b$  is at least 2, it is unclear as to whether the functional group  $R_4$  is repetitive from itself, or always from A. For example, when  $b$  is 2, one of ordinary skill in the art may read the invention to be either of the following:



Therefore, claim 2 is indefinite because it is unclear as to which multi-branched polymer the applicant is claiming as the invention. Claim 8 is similarly rejected.

***Claim Rejections - 35 USC § 102***

3. Claims 1, 7, 13-15 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by *Wang* (US 6,639,032).

*Wang* discloses a process for making hyperbranched polymers from monomers such as 3-allyl 1,2-di(trichloroacetyl)propyl ether (col. 16, Sample 10). This particular monomer is further polymerized in Example 14 (col. 22), which falls within the structural limitations of the instant claims 1. For example, the limitations are met in claim 1 as the following: R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are H, X is -CH<sub>2</sub>-O-CH<sub>2</sub>-CH-, and Y is -O-CO-CH- and a trichloro group.

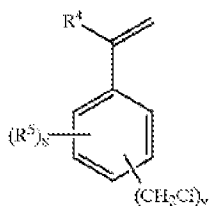
As to claims 13-15, Example 14 discloses the hyperbranched polymer of the above monomer to have a Mw/Mn ratio of 2.5 and a molecular weight of 2900 (col. 22, ll. 65-66).

As to claim 20, *Wang* discloses that the polymers can be star polymers with the hyperbranched nature (col. 12, ll. 26-30).

Claim 7 defines the product by how the product was made. Thus, claim 7 is a product-by-process claim. For purposes of examination, product-by-process claims are not limited to the manipulation of the recited steps, only the structure implied by the steps. See MPEP 2113. In the present case, the recited steps imply a structure having a highly branched molecular structure. The reference suggests such a product.

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4. Claims 1-3, 7-9, and 13-14 are rejected under 35 U.S.C. 102(b) as being anticipated by *Ohsawa et al.* (US 6,551,758).

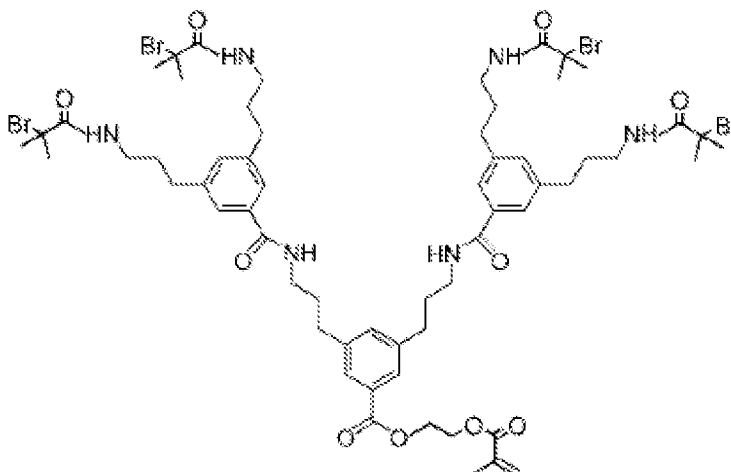


*Ohsawa et al.* discloses a resin used in a resist composition. The resin polymer is a dendritic or hyperbranched polymer, which can be prepared through polymerization of the monomer shown (col. 15, ll. 1-10). The variables are defined that when  $x=0$ ,  $y$  is less than or equal to 5.  $R^4$  can be H or methyl. This monomer meets the claimed formulas (I), (II), (III), (VI), (VII), and (VIII) of instant claims 1, 2, 3, 7, 8, and 9, respectfully. Note, the above monomer, bis(chloromethyl)styrene, is also a preferred monomer of the instant invention (see instant specification p. 29, Example 1).

As to claims 13-15, *Ohsawa et al.* discloses that the dendritic or hyperbranched polymers should have a molecular weight preferably within 2,000 to 100,000 and have a dispersity ( $M_w/M_n$ ) of up to 3.5 (col. 14, ll. 33-42).

5. Claims 1, 4, 6, 10, and 12 are rejected under 35 U.S.C. 102(a) as being anticipated by *Zhang et al.* (*A Covalent-Chemistry Approach to Giant Macromolecules and Their Wetting Behavior on Solid Substrates*. *Angew. Chem. Int. Ed.* **2004**, 43, pp. 5185-5188).)

*Zhang et al.* discloses a multi-branched polymer prepared from the monomer, shown below, which is then polymerized.



6. Claims 5 and 11 are allowable over the cited prior art because the prior art fails to teach a polyoxyalkylene functional group, as required by the instant invention. Further, the prior art that does suggest a polyoxyalkylene functional group between the acrylate and the activating functional group; however, the art fails to teach or suggest the aromatic group having a valency of more than 1.

***Response to Arguments***

7. The applicant argues that the “halogen atom becomes an active halogen atom when the halogen atom is bound to a constituting carbon atom”.

The applicant fails to specifically disclose the definition of "a constituting atom"; however, does disclose examples of possible functional groups which allow for a halogen to become activated. For example, as shown with the monomer above, the bromine atom is bonded to the carbonyl functional group at the alpha-carbon; therefore, it appears to be activated according to the applicants' disclosure. Also, as to the *Wang* reference, the monomers have a trichloro group bonded to a carbonyl functional group at the alpha-carbon; therefore, it appears that at least one of the chlorine atoms is activated, again according to the applicants' disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Briemann R. Fink whose telephone number is (571)270-7344. The examiner can normally be reached on Monday through Friday, 7:00 AM to 4:30 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571)272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. R. F./  
Examiner, Art Unit 1796

/Randy Gulakowski/  
Supervisory Patent Examiner, Art Unit 1796